

AMENDMENTS TO THE SPECIFICATION

On page 1, please amend the second paragraph after the heading "Background of the Invention", beginning on line 9, as follows:

It is known to provide electrosurgical generators ~~which provide with~~ different radio frequency signals for cutting and coagulation, and also to switch between two different instruments, e.g. bipolar and monopolar instruments. In a first type of prior art system, it is also known to provide an electrosurgical instrument with a single electrode, and switching means on the instrument to connect the electrode alternately to either a cutting output or to a coagulating output from the generator. Examples of these types of instrument are to be seen in US 4,427,006, US 5,376,089 and US 5,573,424.

On page 5, please amend the second paragraph after the heading "Description of the Preferred Embodiments", beginning on line 17, as follows:

Referring to Figure 2, the generator comprises a radio frequency (RF) power oscillator 60 having a pair of output lines 60C for coupling via switching circuit 62 to the instrument 12. At least output lines 60C comprise an RF output stage. Switching circuit 62 has three output connections 62A, 62B and 62C for connection to the electrodes of the instrument as will be described later. A capacitor 69 is connected between ~~output connections 62A and 62B~~ output lines 60C, as shown in Figures 2, 11 and 12. Power is supplied to the oscillator 60 by a switched mode power supply 66.

On page 5, please amend the third paragraph after the heading "Description of the Preferred Embodiments", beginning on line 23, as follows:

In the preferred embodiment, the RF oscillator 60 operates at about 400 kHz, with any frequency from 300 kHz upwards into the HF range being feasible. The switched mode power supply typically operates at a frequency in the range of 25 to 50 kHz. Coupled across the output lines 60C is a voltage threshold detector 68 having a first output 68A coupled to the switched mode power supply 16 and a second output 68B coupled to an "on" time control circuit 70. A micro-processor controller 72 coupled to the operator controls and display (shown in

Goble, Colin
Serial No. 10/642,290

Figure 1) is connected to a control input 66A of the power supply 66 for adjusting the generator output power by supply voltage variation and to a threshold-set input 68C of the voltage threshold detector 68 for setting peak RF output voltage limits.

On page 6, please amend the first paragraph beginning on line 1, as follows:

In operation, the microprocessor controller 72 causes power to be applied to the switched mode power supply 66 when electrosurgical power is demanded by the surgeon operating an activation switch arrangement which may be provided on a hand-piece or footswitch (see Figure 1). A constant output voltage threshold is set independently on the supply voltage via input 68C according to control settings on the front panel of the generator (see Figure 1). Typically, for desiccation or coagulation the threshold is set at a desiccation threshold value between 150 volts and 200 volts. When a cutting or vaporisation output is required the threshold is set to a value in the range of from 250 or 300 volts to 600 volts. These voltage values are peak values. Their being peak values means that for desiccation at least it is preferable to have an output RF waveform of low crest factor to give maximum power before the voltage is clamped at the values given. Typically a crest factor of 1.5 or less is achieved.

On page 6, please amend the third paragraph beginning on line 27, as follows:

Instrument 12 carries an identification element 80, such as a resistor, capacitor or EPROM. Identification systems for medical instruments are known in the art, and one type of identification system is described in our earlier patent US 6,074,386. The identification element 80 is interrogated by the controller 72, via lines 81 and 82. The controller 72 can include a sensing circuit 84 adapted to sense the identification element 80 carried by the instrument 12. If the identification element 80 is a resistor, the sensing circuit 84 is adapted to sense the resistance of the identification element 80. Similarly, if the identification element 80 is a capacitor, the sensing circuit 84 is adapted to sense the capacitance of the identification element 80. Finally, if the sensing circuit includes an inductor so as to form a resonant circuit with the identification element 80, the sensing circuit is adapted to determine the resonant frequency of the resonant

Goble, Colin
Serial No. 10/642,290

circuit so as to identify the identification element 80. The identification element provides information as to the type of instrument connected to the generator, and in particular to the number of electrodes present on the instrument. The controller 72, having interrogated the identification element 80 and determined the number of electrodes present on the instrument 12, sends a signal via line 83 to the switch 62, in order to control the operation thereof. The settings of the switch 62 for various types of instrument will be explained in more detail later.

On page 7, please amend the paragraph beginning on line 29, as follows:

The operation of the instrument will now be described. The identification element 80 identifies the instrument 12 to the controller 72 as an instrument having three electrodes, and the controller sets the operating parameters of the switch 62 accordingly. When it is desired to operate the instrument 12 in a cutting mode, footswitch 16A is depressed which causes a signal to be sent to the controller 72 which sets the switching circuit 62 its "cut" position. This is illustrated in Figure 5A, in which the signals from the oscillator 60 are connected between output connections ~~62A-62B~~ and 62C. This means that the RF signal is applied between the cutting electrode 220 (via rod 222) and the jaw member ~~160~~162 (via rod ~~166~~184). At the same time as the controller 72 sets the switching circuit to the position in Figure 5A, it also sends a signal via line 68C to the voltage threshold detector 68 to set the peak output voltage limit to a relatively high "cutting" level. The control of this cutting signal is described in more detail in EP 0754437, referred to earlier.